

Work Order ID 121263

121263

Page 1

June-20-14 7:28:36 AM

Item ID: D412-664-443TRN

Accept

N900040100

Setup Start

NS1

Revision ID:

Stop

NS2

Item Name: Crosstube Turning Detail

Start Date: 6/20/14 Start Qty: 1.00

1

Cust Item ID:

Required Date: 7/04/14 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals:

Process Plan: *W*

Date:

Tooling:

Date:

Run Start

NR1

QC:

Date:

SPC (Y/N):

Date:

Stop

NR2

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

Draw Nbr

Revision Nbr

D412-664-443

Rev A

100

0.00

100

Mori Seiki

Memo

0.00

Mori Seiki CNC Lathe Large

1-Cut tube on chop saw, leave extra mat'l for facing.
2-Face tube to length.

1 0

*mm L
14/06/24*

110

QC1- Inspect dimensions to dimension sheet

0.00

110

QC

Memo

0.00

Quality Control

1 0

*mm L
14/06/25*

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Required Date: 7/04/14

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Date:

Tooling:

Date:

Run Start

NR1

QC:

Date:

SPC (Y/N):

Date:

Stop

NR2

Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Tool ID

Tool #

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

120

0.00

120

Mori Seiki

Memo

0.00

Mori Seiki CNC Lathe Large

1-Fill tube with sand & install plugs on both ends
2-Turn as per Folio FB216
3- File transition lines smooth.
4-Scribe part # as per Dwg D412-664-443
FOLIO REV: AA
DWG REV: A

130

0.00

130

QC

Memo

0.00

Quality Control

140

0.00

140

QC

Memo

0.00

Quality Control

1 0
summary
14/06/25

1 0
summary
14/06/25

14.07-07

Work Order ID 121263

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121263

Page 3

Item ID: D412-664-443TRN

Accept

N900040100

Setup Start

NS1

Revision ID:

Stop

NS2

Item Name: Crosstube Turning Detail

Start Date: 6/20/14

Start Qty: 1.00

1

Cust Item ID:

Required Date: 7/04/14

Req'd Qty: 1.00

1

Customer:

Reference:

Approvals:

Process Plan:

Date:

Tooling:

Date:

Run Start

NR1

QC:

Date:

SPC (Y/N):

Date:

Stop

NR2

Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Tool ID

Tool #

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

150

150

Crosstubes

Large Fab

0.00

Memo

0.00

Crosstubes

Grind machining marks smooth longitude way.

BL

14-07-07

180

180

QC

QC15- Crosstube Dimensional Check

0.00

Memo

0.00

Quality Control

N/A

BL

14-07-08

190

190

Packaging

Identify as per dwg & Stock Location:

0.00

Packaging

Memo

0.00

Packaging

Identify and stock in kanban rack
Location: LG

BL

14-07-08

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June-20-14 7:28:36 AM

Item ID: D412-664-443TRN

Accept

N900040100

Setup Start *NS1*

Revision ID:

Item Name: Crosstube Turning Detail

Stop *NS2*

Start Date: 6/20/14 Start Qty: 1.00 *1*

Cust Item ID:

Required Date: 7/04/14 Req'd Qty: 1.00 *1*

Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start *NR1*

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop *NR2*

Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Tool ID

Tool #

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

200

QC21- Final Inspection - Work Order Release

0.00

2000

QC

Memo

0.00

Quality Control

MLJ 14-07-08

4-7-8

Picklist Print

June-20-14 7:28:35 AM

Page 1

Work Order ID: 121263

121263

Parent Item: D412-664-443TRN

D412-664-443TRN

Parent Item Name: Crosstube Turning Detail

Start Date: 6/20/14

Required Date: 7/04/14

Start Qty: 1.00

Required Qty: 1.00

Comments: IPP REV:A NEW ISSUE 13-09-26 JLM VERIFIED BY:DD

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
D6020-160		Manufactured	No				Each	19.0000		1			
D6020-160									**				
Crosstube Material													

Location

Loc Qty

Loc Code

BSKT

11

98110

11

prelim

8

105163

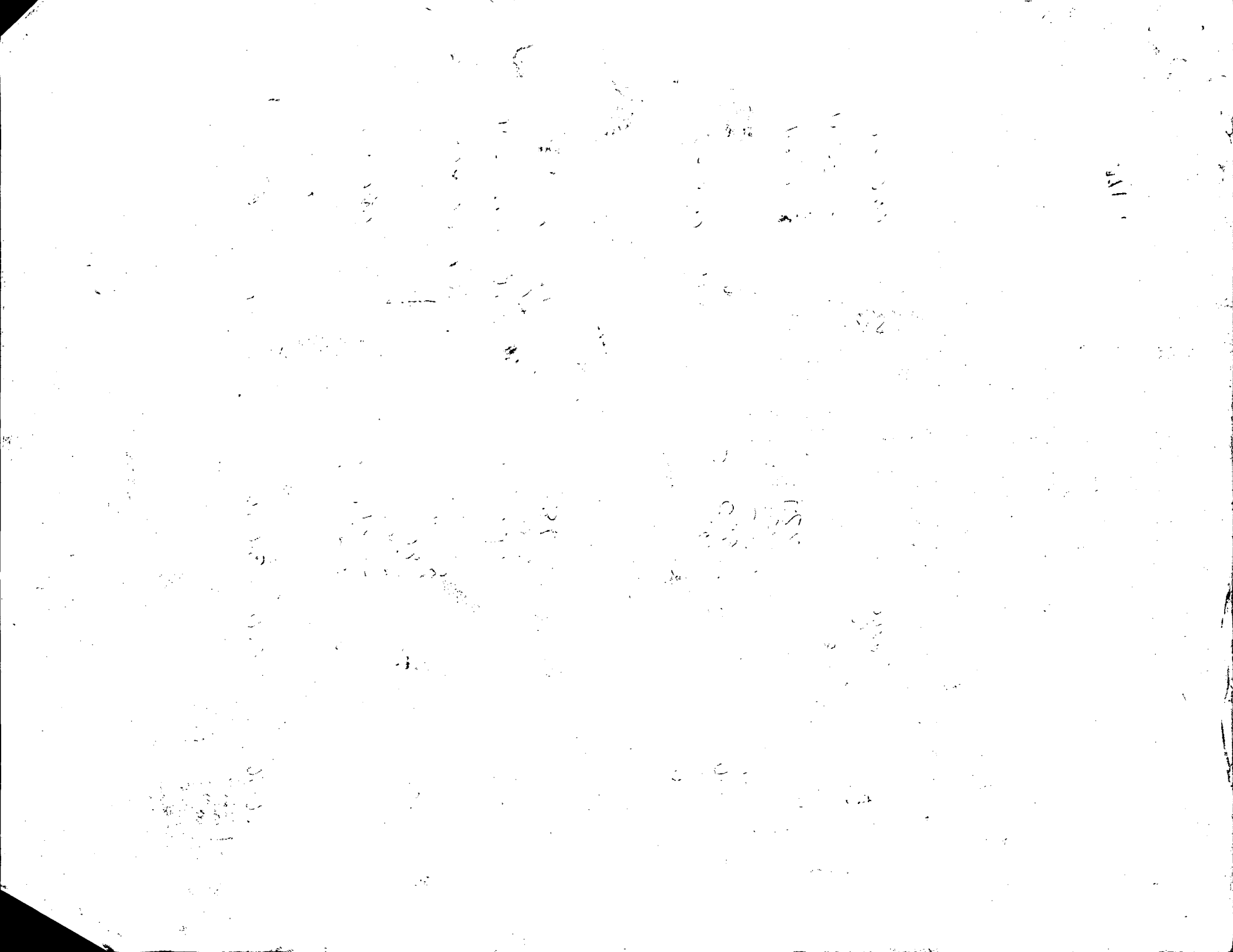
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1 mml 14/06/23

DART AEROSPACE LTD		Work Order: 121263
Description: Crosstube Assembly		Part Number:
Inspection Dwg:	Rev:	Page 1 of 2

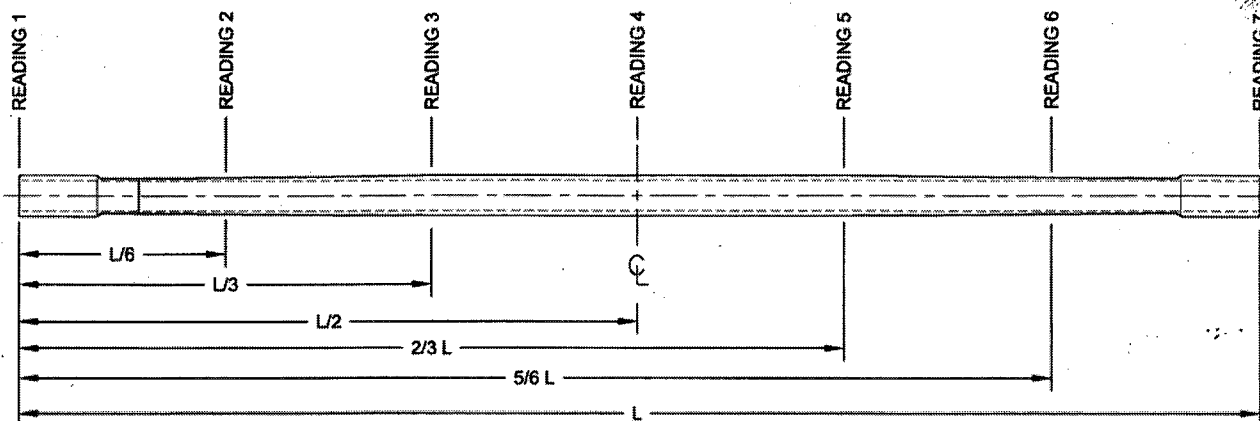
FIRST ARTICLE INSPECTION CHECKLIST

Inspection Sheet Drawing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
SIDE A						
	7.98	± 0.060	7.98	-	vern	CNC-08
	0.500	± 0.010	.500	-	RG	
	2.990	± 0.005 -0.000	2.993	-	mic	CNC-04
	2.776	± 0.005 -0.000	2.779	-	mic	CNC-04
	2.776	± 0.005 -0.000	2.780	-		
	2.880	± 0.005 -0.000	2.882	-		
	2.990	± 0.005 -0.000	2.992	-		
	3.100	± 0.005 -0.000	3.101	-	mic	CNC-05
	3.250	± 0.005 -0.000	3.254	-	11	
SIDE B						
	7.98	± 0.060	7.98	-	vern	CNC-08
	0.500	± 0.010	.500	-	RG	
	2.990	± 0.005 -0.000	2.990	-	mic	CNC-04
	2.776	± 0.005 -0.000	2.776	-	mic	CNC-04
	2.776	± 0.005 -0.000	2.776	-		
	2.880	± 0.005 -0.000	2.882	-		
	2.990	± 0.005 -0.000	2.992	-		
	3.100	± 0.005 -0.000	3.101	-	mic	CNC-05
	3.250	± 0.005 -0.000	3.254	-	11	
	130.100	± 0.060	130.090	-	type	LG-11



DART AEROSPACE LTD		Work Order: 121263
Description: Crosstube Assembly		Part Number:
Inspection Dwg:	Rev:	Page 2 of 2

WALL THICKNESS MEASUREMENT



Location	WALL THICKNESS MEASUREMENT (IN)				Deviation Δw (max-min)	TOLERANCE
	w1	w2	w3	w4		
READING 1 L= 0"	.296	.304	.301	.294	.010	
READING 2 L= 21.5	.185	.206	.199	.183	.023	
READING 3 L= 43.5	.307	.321	.308	.295	.026	
READING 4 L= 65	.426	.438	.429	.419	.019	
READING 5 L= 86.5	.309	.318	.306	.297	.021	
READING 6 L= 108.5	.185	.205	.196	.177	.028	
READING 7 L= 130.10	.294	.323	.301	.273	.050	

Calibration Result

Actual Block Thickness: .100 - .750

Sitiescan 250 Measured Thickness: .100 - .750

Measured by: <i>gman-c</i>	Audited by: <i>JW</i>	Preliminary Approval:
Date: 14/06/26	Date: 14-07-09	Date:

Rev	Date	Change	Revised by	Approved
B	10.04.14	Added preliminary approval	KJ	
C	12.06.01	Wall thickness form added	KJ	

Item	Qty	Part Number	Description
	-443		
1	X	D412-664-443	CROSSTUBE ASSEMBLY (412 HI AFT)
2	1	D6020-132	CROSSTUBE MATERIAL (132" MIN. LENGTH)
3	2	D3595-063-530	RUBBER CUSHION
4	1	D4909-1	SUPPORT
5	2	D4910-1	CHAFING SHIELD
7	4	MS21920-26	CLAMP
8	2	MS21920-28	CLAMP
9	A/R	SCOTCH-WELD DP460	EPOXY ADHESIVE, 3M SCOTCH-WELD
10	A/R	PROSEAL 890	SEALANT

GENERAL NOTES:

- 1) MATERIAL: MANUFACTURED FROM D6020-132
FINISHED LENGTH = 130.10±0.060 (BEFORE BENDING/TRIMMING)
- 2) FINISH: PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
MASK UNDERSIDE OF CROSSTUBE AS SHOWN (ZN C6-2, HATCHED AREA)
PAINT OUTSIDE PER DART QSI 005 4.2
AFTER PAINTING, REMOVE MASKING AND APPLY MATTE CLEAR COAT PER DART QSI 005 4.2
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- 6) IDENTIFICATION: SCRIBE DART P/N "D412-664-443" AND B/N ON INSIDE OF CUFF PER DART QSI 044 6.4 (VIBRATING STYLUS)
- 7) WEIGHT: 90.2 lb AFTER MACHINING
86.7 lb FINISHED WEIGHT
- 8) PART IS SYMMETRIC ABOUT CENTERLINE.
- 9) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.

BENDING

- 10) BEND PROGRESSIVELY WITH A MINIMUM OF 8 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 7% (BASED ON O.D.) IN LOWER HALF OF R35 BEND AND 6% (BASED ON O.D.) ON REMAINING TUBE.
- 11) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038. TO BE PERFORMED AFTER FINAL POST-BEND GRINDING. ANY ADDITIONAL GRINDING REQUIRES ANOTHER LPI INSPECTION.

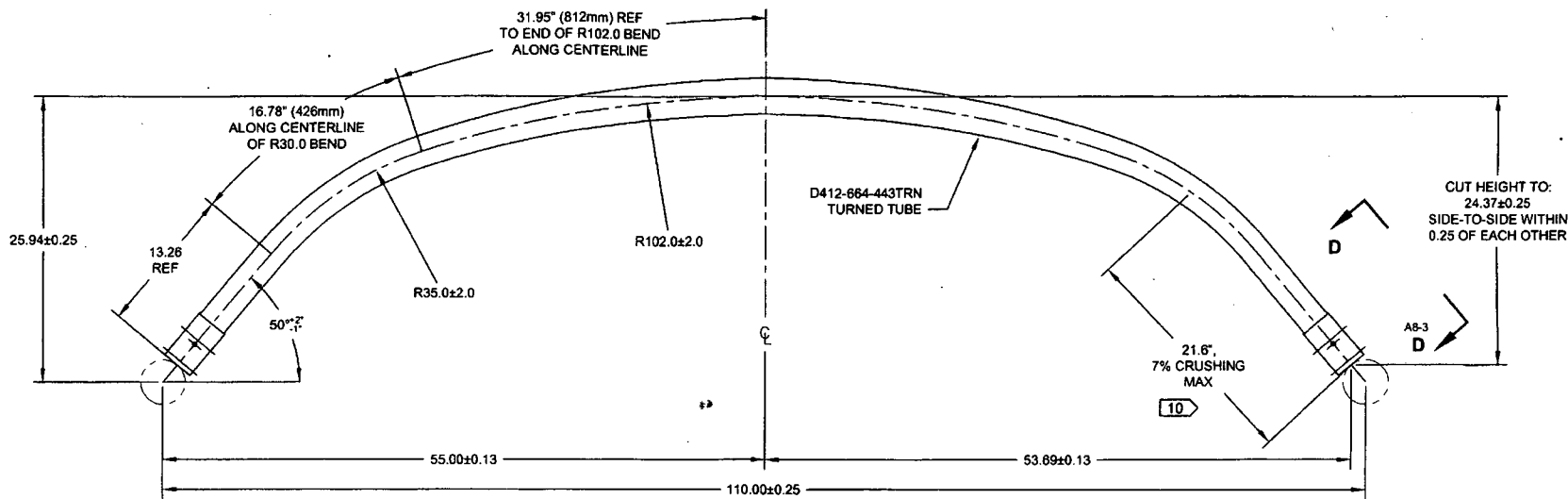
ASSEMBLY

- 12) INSTALL D4909-1 CENTER SUPPORT USING A 0.04" TO 0.07" THICK LAYER OF SCOTCH-WELD DP460 PER QSI 015.
- 13) INSTALL MS21920-28 CLAMPS WITH D3595-063-530 RUBBER CUSHIONS TO SECURE THE D4909-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE ON TOP OF CROSSTUBE SUPPORT.
- 14) IF NOT ALREADY PRESENT ON CHAFING SHIELD, APPLY A THIN COAT OF PROSEAL 890 ON INSIDE CONCAVE SURFACE OF D4910-1 CHAFING SHIELD AND LET CURE PER MANUFACTURER'S INSTRUCTIONS. INSTALL PROSEAL D4910-1 CHAFING SHIELD ONTO CROSSTUBE BY APPLYING A THIN COAT OF PROSEAL 890 ONTO CROSSTUBE. BE SURE TO ELIMINATE ANY AIR GAPS.
- 15) TORQUE CLAMPS ON D4909-1 SUPPORT 80 TO 100 IN-LB. TORQUE CLAMPS ON D4910-1 CHAFING SHIELD 40 TO 50 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING. PRIOR TO PACKAGING, RE-CHECK TORQUE ON CLAMPS AFTER ADHESIVES HAVE CURED FOR 24 HOURS.

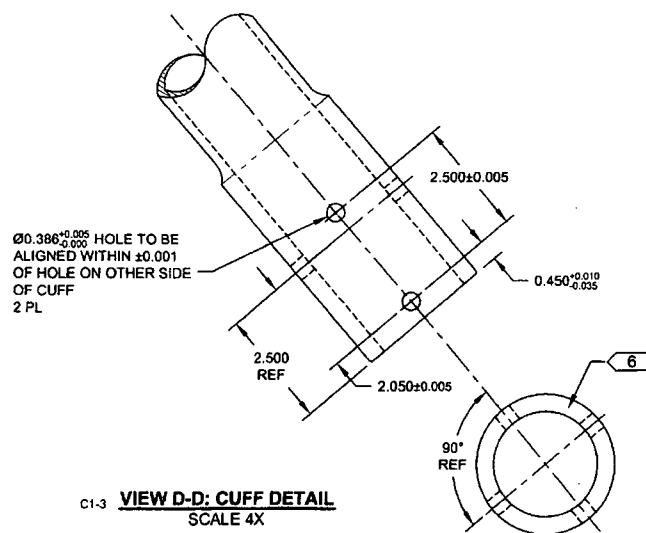
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12/26/03

RELEASED
2014-05-26
MP

A	NEW ISSUE	CP	14.04.01
REV.	DESCRIPTION	BY	DATE
DESIGN	<i>P</i>	DART AEROSPACE LTD	
DRAWN	<i>P</i>	HAWKESBURY, ONTARIO, CANADA	
CHECKED	<i>SW</i>	DRAWING NO.	REV. A
MFG. APPR.	<i>SW</i>	D412-664-443	SHEET 1 OF 4
APPROVED	<i>SW</i>	TITLE	SCALE
DE APPR.	<i>SW</i>	CROSSTUBE ASSY (412 HI AFT)	NTS
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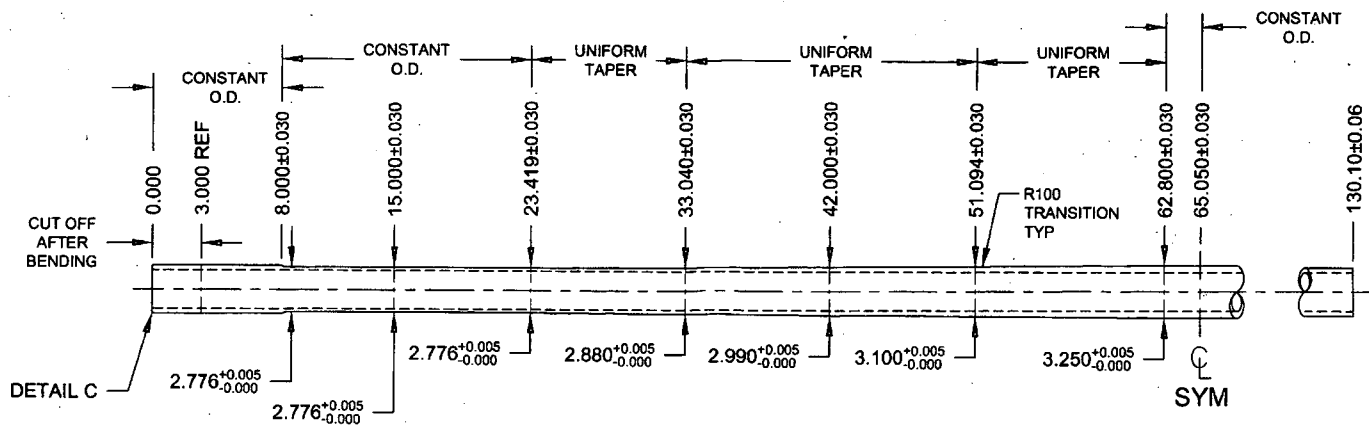
D412-664-443BND 10
BENDING DETAIL



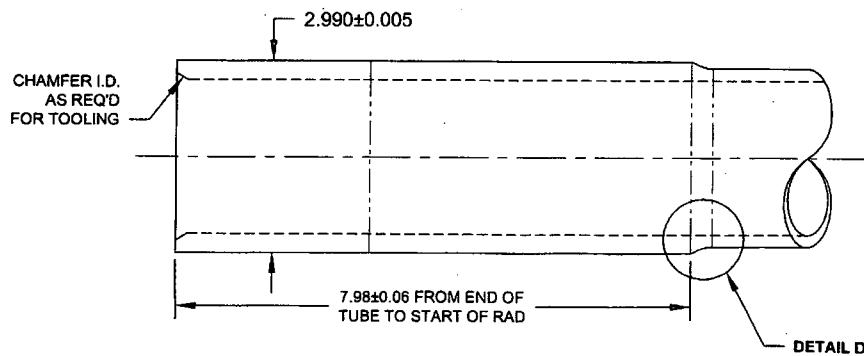
C1-3 **VIEW D-D: CUFF DETAIL**
SCALE 4X

RELEASED
2014-05-26
mp

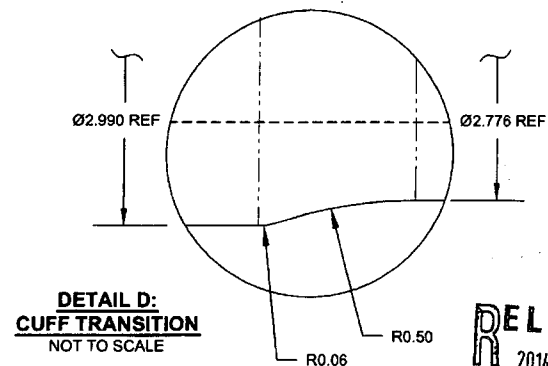
DESIGN	Q	DART AEROSPACE LTD	
DRAWN	Q	HAWKESBURY, ONTARIO, CANADA	
CHECKED	DW	DRAWING NO.	REV. A
MFG. APPR.		D412-664-443	SHEET 3 OF 4
APPROVED		TITLE	SCALE
DE APPR.		CROSSTUBE ASSY (412 HI AFT)	NTS
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D412-664-443TRN
TURNING DETAIL



DETAIL C:
CUFF TRANSITION
SCALE 4X



RELEASED
2014-05-26

DESIGN	90	DART AEROSPACE LTD	
DRAWN	90	HAWKESBURY, ONTARIO, CANADA	
CHECKED	DLV	DRAWING NO.	REV. A
MFG. APPR.		D412-664-443	SHEET 4 OF 4
APPROVED		TITLE	SCALE
DE APPR.		CROSSTUBE ASSEMBLY (412 HI AFT)	NTS
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